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09/774,926	01/31/2001	Tomokazu Kakumoto	15162/03120	5322

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EXAMINER

YE, LIN

ART UNIT

PAPER NUMBER

2615

DATE MAILED: 11/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/774,926

Applicant(s)

KAKUMOTO ET AL.

Examiner

Lin Ye

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 5 and 7-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 6 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 October 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 9/6/2005 have been fully considered but they are not persuasive as to claims 1-3 and 6.

For claim 1, the applicant argues that Chen reference (U.S. Patent 6,128,039) does not disclose a selector circuit having a non-differential buffer that alternating outputs image signals and noise signals from each of the plurality of pixels (See Applicant's REMARKS, page 8, lines 1-9).

The examiner disagrees. The examiner understands that applicant's specification and Figure 7 discloses a solid-state image-sensing device comprising: a plurality of selector circuits (e.g., SWa, SWb, SW1a, SW1b, SW2a and SW2b), four holding circuits and each having non-differential buffer for sampling and holding image signals and noise signals alternately provided one for each column of the matrix of the pixels; the first (Ca) and second (Cb) holding circuits are connected with the third (Cc) and fourth (Cd) holding circuits by a single non-differential buffer (6). However, the claim 1 does not require all those limitations and also never disclose how those selector circuits related to the four holding circuits as shown in Figure 7. Therefore, The Chen reference is still readable on the claim 1, e.g., the Chen reference discloses in Figures 6 and 7, a plurality of selector circuits (e.g., switches k2 and k3) provided one for each column of the matrix of the pixels and each having a non-differential buffer (e.g., capacitors C3, buffer 311a, capacitors C4 and buffer 311b), the selector circuits each receiving, from a plurality of pixels belonging to a corresponding

column of the matrix, image signals (Vc3) and noise signals (e.g., Vc4, the noise signals includes KTC noise and the fixed pattern noise) representing variations in sensitivity and then outputting the image signals and the noise signals alternately through the buffer (e.g., see the Figure 7I, the time chart for outputting signals from the non-differential buffer. It shows the voltage of capacitor C3, Vc3 as image signals output during time T6-T7, the voltage of capacitor C4, Vc4 as noise signals output during time T9-T11. This clearly shows outputting the image signals and the noise signals alternately through the buffer, see Col. 10, lines 5-8, lines 40-56).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1 and 3 are rejected under 35 U.S.C. 102(e) as being anticipated by Chen et al. U.S. Patent 6,128,039.

Referring to claim 1, the Chen reference discloses in Figures 6 and 7, a solid-state image-sensing device comprising: a plurality of pixels (301) arranged in a matrix and each generating an electric signal proportional to an amount of incident light; a plurality of selector circuits (e.g., switches k2 and k3) provided one for each column (bit line BL) of the

matrix of the pixels and each having a non-differential buffer (e.g., capacitors C3, buffer 311a, capacitors C4 and buffer 311b), the selector circuits each receiving, from a plurality of pixels belonging to a corresponding column of the matrix, image signals (Vc3) and noise signals (e.g., Vc4, the noise signals includes KTC noise and the fixed pattern noise) representing variations in sensitivity and then outputting the image signals and the noise signals alternately through the buffer (e.g., see the Figure 7I, the time chart for outputting signals from the non-differential buffer. It shows the voltage of capacitor C3, Vc3 as image signals output during time T6-T7, the voltage of capacitor C4, Vc4 as noise signals output during time T9-T11. This clearly shows outputting the image signals and the noise signals alternately through the buffer, see Col. 10, lines 5-8, lines 40-56); and a correction circuit (amplifier 413) receiving the image signals (Vc3) and the noise signals (Vc4) sequentially from one selector circuit (K2 or K3) after another and correcting the image signals on a basis of the noise signals (See Col. 10, lines 59-64).

Referring to claim 3, the Chen reference discloses wherein the selector circuits each comprise: a first holding circuit (capacitors C3) for sampling and holding the image signals output from the pixels (Vc3); and a second holding circuit (C4) for sampling and holding the noise signals output from the pixels (e.g., Vc4 include KTC noise and fixed pattern noise that output from the pixels); wherein, in each selector circuit (k2 or K3), the image signals and the noise signals are first sampled and held in the first and second holding circuits respectively, and are then alternately fed through the buffer (buffer 311a or buffer 311b) to the correction circuit (413).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. U.S. Patent 6,128,039 in view of Kozlowski et al. U.S. Patent 6,587,142.

Referring to claim 2, the Chen reference discloses all subject matter as discussed with respect to claim 1, except that the Chen reference does not explicitly show a plurality of constant-current sources provided one for each column of the matrix.

The Kozlowski reference teaches in Figure 2, a CMOS image sensor comprising an array of 1032 columns by 776 rows of photo detectors (See Col. 6, lines 51-55); and plurality of constant-current sources (ISRC common current source 30) provided one for each column of the matrix and each supplying a constant current to pixels belonging to a corresponding column of the matrix. The Kozlowski reference is evidence that one of ordinary skill in the art at the time to see more advantages the constant-current source provided one for each column of the matrix image sensor so that efficiently transfers the conditioned, photo-induced signals voltage from each row-selected photo detector (See Col. 8, lines 15-23). For that reason, it would have been obvious to one of ordinary skill in the art to modify the image-sensing device of Chen ('039) by providing plurality of constant-current sources to

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one for each column of the matrix and each supplying a constant current to pixels belonging to a corresponding column of the matrix as taught by Kozlowski ('142).

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. U.S. Patent 6,128,039 in view of Collins et al. U.S. 6,507,519.

Referring to claim 6, the Chen reference discloses all subject matter as discussed with respect to claim 1, except that the Chen reference does not explicitly show the electric signal output from each pixel is natural-logarithmically proportional to the amount of incident light.

The Collins reference teaches in Figures 2-3, an image-sensing device (See Col. 5, lines 41) comprising: a plurality of pixels (each pixels show in Figure 3) that generate an electric signal proportional to an amount of incident light and then output the electric signal (V_x) as an analog signal that is natural-logarithmically proportional to the amount of incident light (See Col. 5, lines 65-66). The Collins reference is evidenced that one of ordinary skill in the art at the time of the invention to see more advantages when the imaging-sensing device is a logarithmic type imaging sensor so that has very wide dynamic range with makes the imaging-sensing device suitable for imaging external scenes (See Col. 6, lines 15-22). For that reason, it would have been obvious one having ordinary skill in the art at the time of the invention was made to modify the imaging-sensing device of Chen ('039) by providing a logarithmic type imaging sensor for generating the output imaging electric signal as an analog signal that is natural-logarithmically proportional to the amount of incident light as taught by Collins ('519).

Allowable Subject Matter

7. Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:

The prior art does not teach or fairly suggest a solid-state image-sensing device comprising: a plurality of selector circuits provided one for each column of the matrix of the pixels and each having a non-differential buffer, the selector circuits each receiving, from a plurality of pixels belonging to a corresponding column of the matrix, image signals and noise signals representing variations in sensitivity and then outputting the image signals and the noise signals alternately through the buffer, a first holding circuit for sampling and holding the image signals output from the pixels; a second holding circuit for sampling and holding the noise signals output from the pixels; a third holding circuit for sampling and holding the image signals output from the first holding circuits provided in the selector circuits; a fourth holding circuit for sampling and holding the noise signals output from the second holding circuits provided in the selector circuits; and a differential amplifier for outputting the image signals after correcting the image signals by subtracting the noise signals output from the fourth holding circuit from the image signals output from the third holding circuit; and in combination with all of the other limitations of the claims 1, 3 and 4.

Conclusion

9. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

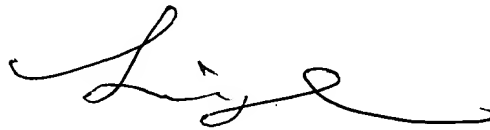
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lin Ye whose telephone number is (571) 272-7372. The examiner can normally be reached on Mon-Fri 8:00AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Ometz can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in dark ink, appearing to read 'Lin Ye', with a stylized, flowing script.

Lin Ye
Examiner
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November 16, 2005